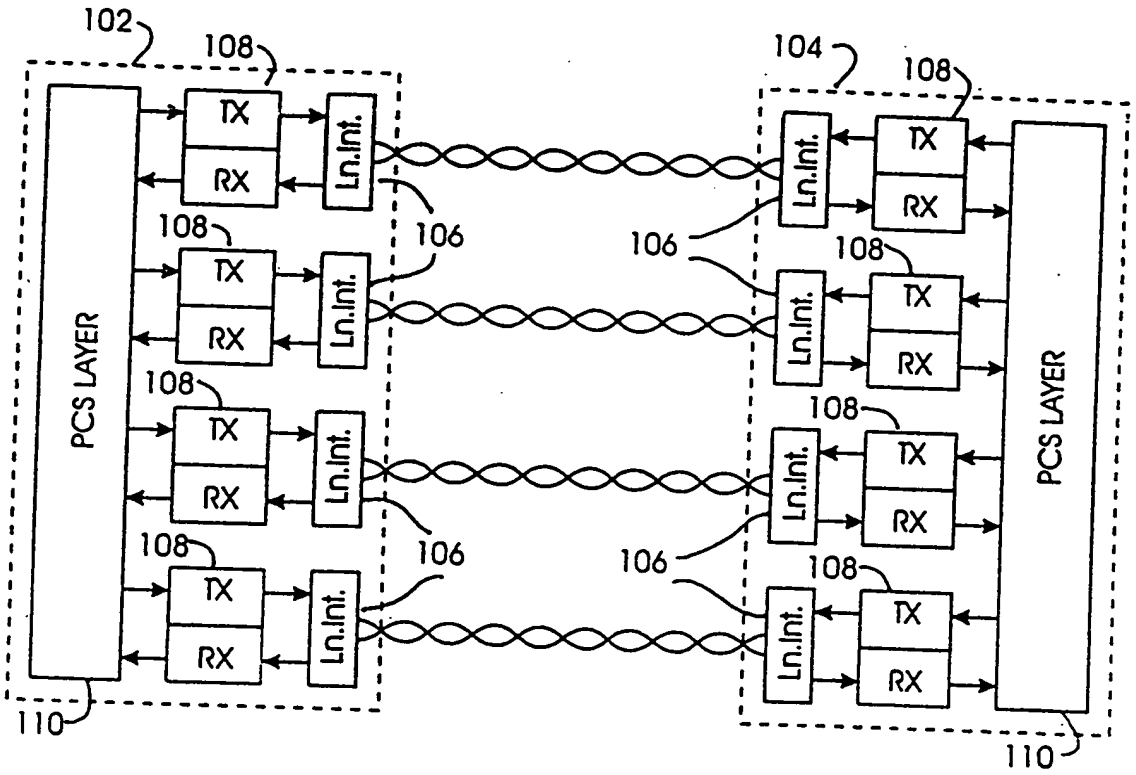

FIG. 1

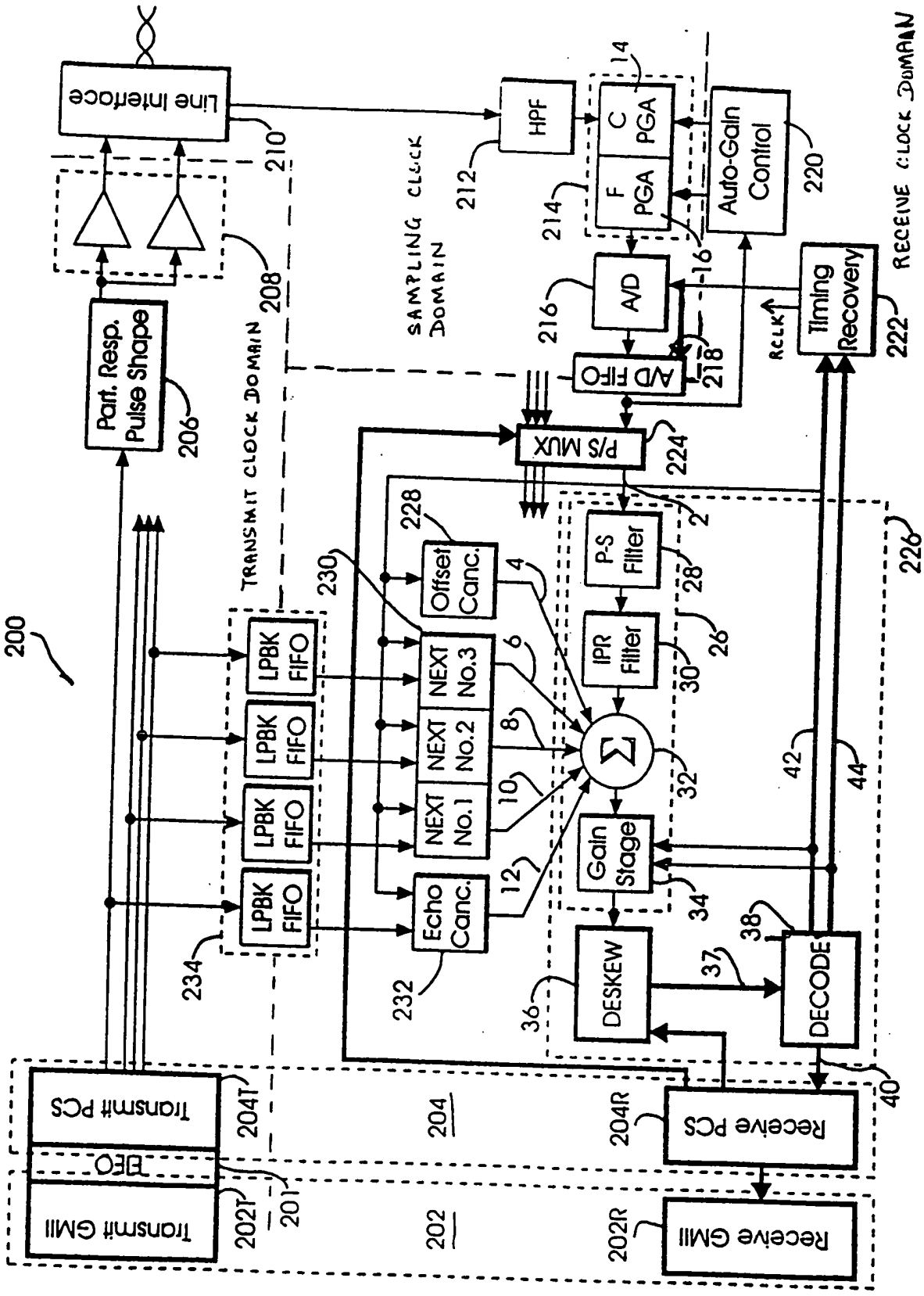
200
Transmit GMII
BEO
Transmit PCS
202T
201
204T
202
204
Receive GMII
Receive PCS
202R
204R
TRANSMIT CLOCK DOMAIN
SAMPLING CLOCK DOMAIN
RECEIVE CLOCK DOMAIN
Part. Resp. Pulse Shape
206
208
Line Interface
210
HPF
212
C PGA
F PGA
214
14
Auto-Gain Control
220
A/D
216
16
A/D FIFO
218
RCLK
Timing Recovery
222
P/S MUX
224
226
2
P-S Filter
28
IPR Filter
30
26
Offset Canc.
228
4
NEXT No.3
6
NEXT No.2
8
NEXT No.1
10
Echo Canc.
12
230
232
LPBK FIFO
LPBK FIFO
LPBK FIFO
LPBK FIFO
234
Σ
32
Gain Stage
34
42
44
DESKEW
36
37
DECODE
38
40

FIG. 2

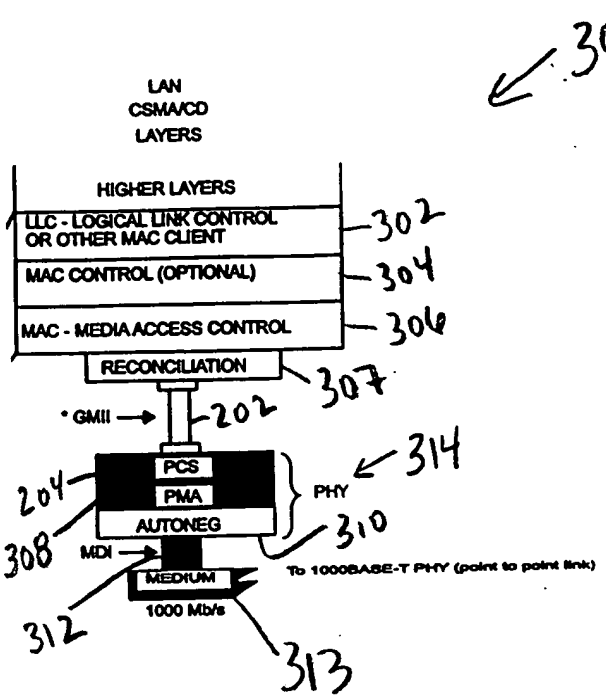
300
LAN
CSMA/CD
LAYERS
HIGHER LAYERS
LLC - LOGICAL LINK CONTROL
OR OTHER MAC CLIENT
302
MAC CONTROL (OPTIONAL)
304
MAC - MEDIA ACCESS CONTROL
306
RECONCILIATION
307
GMII
202
PCS
PMA
AUTONEG
PHY
314
204
308
310
MDI
MEDIUM
1000 Mb/s
To 1000BASE-T PHY (point to point link)
312
313

FIG. 3

$Sy_n[0] = Scr_n[0]$

$Sy_n[1] = g(Scr_n[0]) = Scr_n[3] \wedge Scr_n[8]$

$Sy_n[2] = g^2(Scr_n[0]) = Scr_n[6] \wedge Scr_n[16]$

$Sy_n[3] = g^3(Scr_n[0]) = Scr_n[9] \wedge Scr_n[14] \wedge Scr_n[19] \wedge Scr_n[24]$

$Sx_n[0] = X_n = Scr_n[4] \wedge Scr_n[6]$

$Sx_n[1] = g(X_n) = Scr_n[7] \wedge Scr_n[9] \wedge Scr_n[12] \wedge Scr_n[14]$

$Sx_n[2] = g^2(X_n) = Scr_n[10] \wedge Scr_n[12] \wedge Scr_n[20] \wedge Scr_n[22]$

$Sx_n[3] = g^3(X_n) = Scr_n[13] \wedge Scr_n[15] \wedge Scr_n[18] \wedge Scr_n[20] \wedge Scr_n[23] \wedge Scr_n[25] \wedge Scr_n[28] \wedge Scr_n[30]$

$Sg_n[0] = Y_n = Scr_n[1] \wedge Scr_n[5]$

$Sg_n[1] = g(Y_n) = Scr_n[4] \wedge Scr_n[8] \wedge Scr_n[9] \wedge Scr_n[13]$

$Sg_n[2] = g^2(Y_n) = Scr_n[7] \wedge Scr_n[11] \wedge Scr_n[17] \wedge Scr_n[21]$

$Sg_n[3] = g^3(Y_n) = Scr_n[10] \wedge Scr_n[14] \wedge Scr_n[15] \wedge Scr_n[19] \wedge Scr_n[20] \wedge Scr_n[24] \wedge Scr_n[25] \wedge Scr_n[29]$

FIG. 4

$Sy_n[0] = Scr_{n+1}[0]$

$Sy_n[1] = g(Scr_n[0]) = Scr_n[3] \wedge Scr_n[8]$

$Sy_n[2] = g^2(Scr_n[0]) = Scr_n[6] \wedge Scr_n[16]$

$Sy_n[3] = g^3(Scr_n[0]) = Scr_n[9] \wedge Scr_n[14] \wedge Scr_n[19] \wedge Scr_n[24]$

$Sx_n[0] = X_n = Scr_n[4] \wedge Scr_n[6]$

$Sx_n[1] = g(X_n) = Scr_n[7] \wedge Scr_n[9] \wedge Scr_n[12] \wedge Scr_n[14]$

$Sx_n[2] = g^2(X_n) = Scr_n[10] \wedge Scr_n[12] \wedge Scr_n[20] \wedge Scr_n[22]$

$Sx_n[3] = g^3(X_n) = Scr_n[13] \wedge Scr_n[15] \wedge Scr_n[18] \wedge Scr_n[20] \wedge Scr_n[23] \wedge Scr_n[25] \wedge Scr_n[28] \wedge Scr_n[30]$

$Sg_n[0] = Y_n = Scr_n[1] \wedge Scr_n[5]$

$Sg_n[1] = g(Y_n) = Scr_n[4] \wedge Scr_n[8] \wedge Scr_n[9] \wedge Scr_n[13]$

$Sg_n[2] = g^2(Y_n) = Scr_n[7] \wedge Scr_n[11] \wedge Scr_n[17] \wedge Scr_n[21]$

$Sg_n[3] = g^3(Y_n) = Scr_n[10] \wedge Scr_n[14] \wedge Scr_n[15] \wedge Scr_n[19] \wedge Scr_n[20] \wedge Scr_n[24] \wedge Scr_n[25] \wedge Scr_n[29]$

FIG. 5

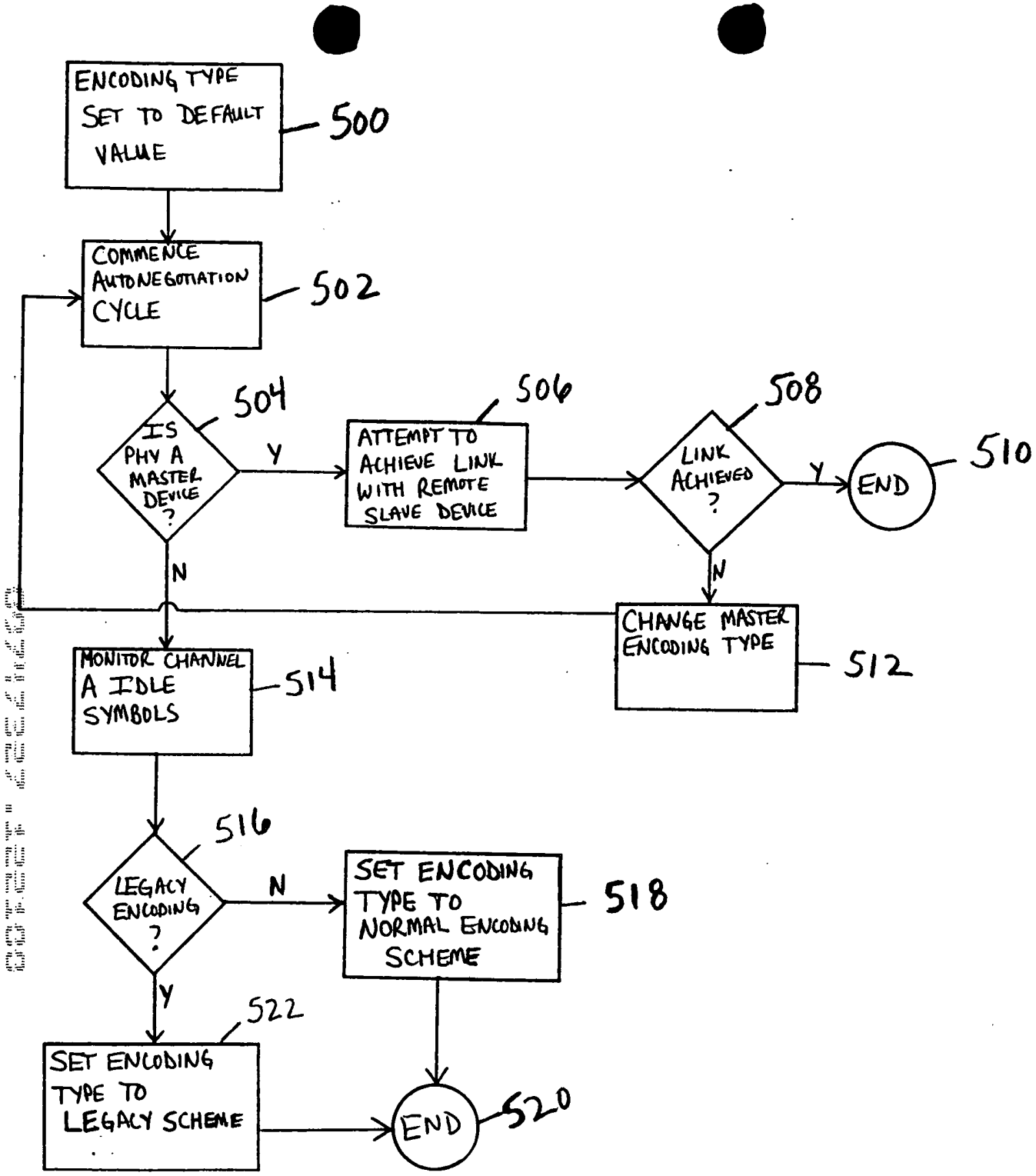
ENCODING TYPE SET TO DEFAULT VALUE
500
COMMENCE AUTONEGOTIATION CYCLE
502
IS PHY A MASTER DEVICE ?
504
Y
ATTEMPT TO ACHIEVE LINK WITH REMOTE SLAVE DEVICE
506
LINK ACHIEVED ?
508
Y
END
510
N
CHANGE MASTER ENCODING TYPE
512
MONITOR CHANNEL A IDLE SYMBOLS
514
LEGACY ENCODING ?
516
N
SET ENCODING TYPE TO NORMAL ENCODING SCHEME
518
Y
SET ENCODING TYPE TO LEGACY SCHEME
522
END
520

FIG. 6

	First Autonegotiation cycle		Second Autonegotiation cycle	
	PHY A	PHY B	PHY A	PHY B
PHY Type	legacy	legacy	N/A	
Master/Slave	Master	Slave		
EncodingType	legacy	legacy		
Result	Link up	Link up		

FIG. 7

	First Autonegotiation cycle		Second Autonegotiation cycle	
	PHY A	PHY B	PHY A	PHY B
PHY Type	legacy	Other	N/A	
Master/Slave	Master	Slave		
EncodingType	legacy	Either		
Result	Link up	Detects legacy encoding, sets EncodingType to legacy , starts transmitting IDLE and links up.		

FIG. 8

	First Autonegotiation cycle		Second Autonegotiation cycle	
	PHY A	PHY B	PHY A	PHY B
PHY Type	legacy	Other	N/A	
Master/Slave	Slave	Master		
EncodingType	legacy	legacy		
Result	Link up	Link up		

FIG. 9

	First Autonegotiation cycle		Second Autonegotiation cycle	
	PHY A	PHY B	PHY A	PHY B
PHY Type	legacy	Other	legacy	Other
Master/Slave	Slave	Master	Slave	Master
EncodingType	legacy	Normal	legacy	legacy
Result	Fails to link, restarts autonegotiation	Fails to link, flips EncodingType to legacy , restarts autonegotiation	Link up	Link Up

FIG. 10

	First Autonegotiation cycle		Second Autonegotiation cycle	
	PHY A	PHY B	PHY A	PHY B
PHY Type	Other	Other	legacy	Other
Master/Slave	Master	Slave	N/A	
EncodingType	legacy	legacy		
Result	Link Up	Link Up		

FIG. 11

	First Autonegotiation cycle		Second Autonegotiation cycle	
	PHY A	PHY B	PHY A	PHY B
PHY Type	Other	Other	N/A	
Master/Slave	Master	Slave		
EncodingType	legacy	Normal		
Result	Link Up	Detects legacy encoding, sets EncodingType to legacy , starts transmitting IDLE and links up.		

FIG. 12

	First Autonegotiation cycle		Second Autonegotiation cycle	
	PHY A	PHY B	PHY A	PHY B
PHY Type	Other	Other	N/A	
Master/Slave	Master	Slave		
EncodingType	Normal	Normal		
Result	Link Up	Link Up		

FIG. 13

	First Autonegotiation cycle		Second Autonegotiation cycle	
	PHY A	PHY B	PHY A	PHY B
PHY Type	Other	Other	N/A	
Master/Slave	Master	Slave		
EncodingType	Normal	legacy		
Result	Link Up	Detects normal encoding, sets EncodingType to normal, starts transmitting IDLE and links up.		

FIG. 14

SLAVE SILENT STATE OF PHY CONTROL STATE DIAGRAM

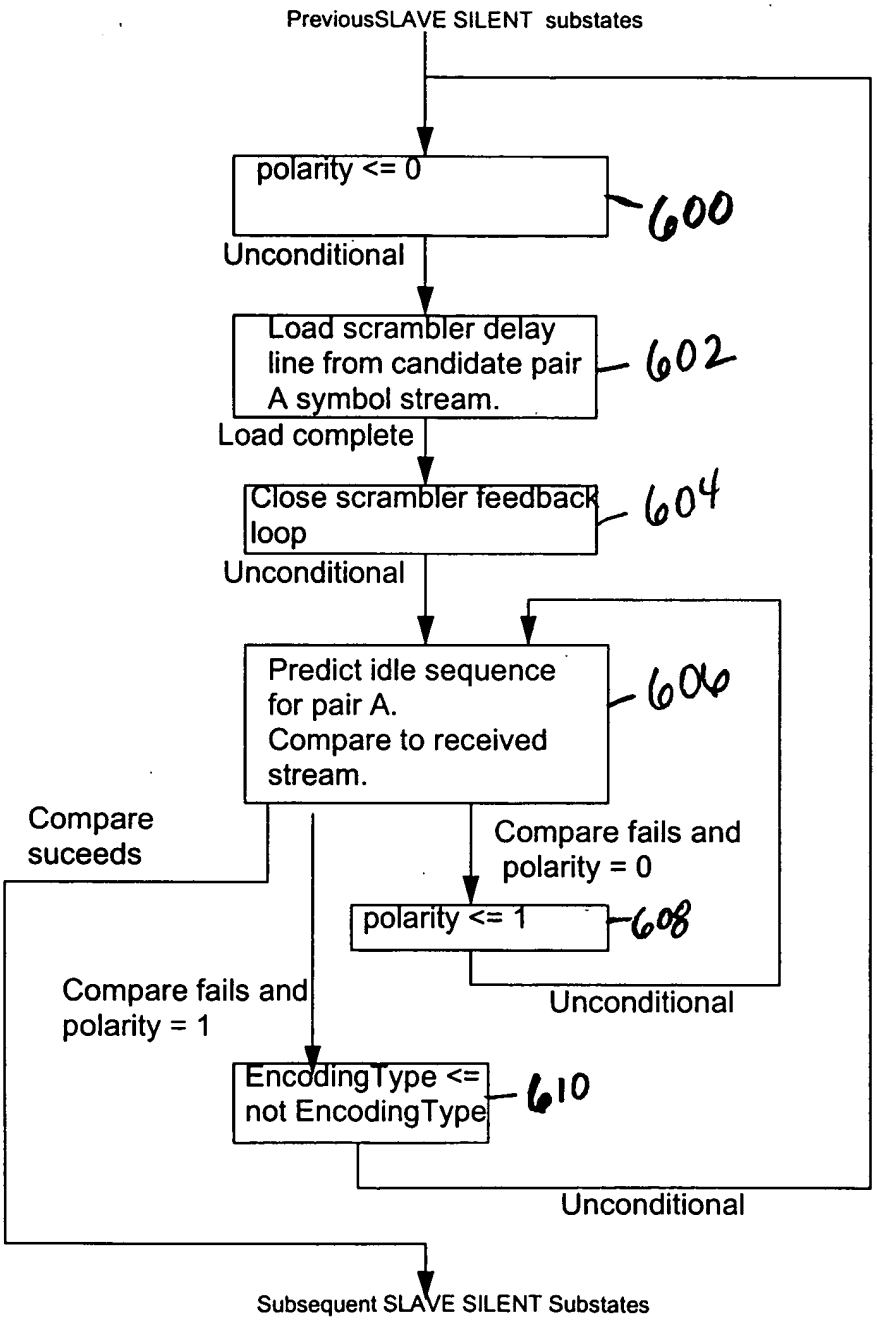

FIG. 15